Operating Instructions

VEGAMIP R62

Receiving unit

- Relay

Document ID: 41912

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Safety instructions for Ex areas

Please note the Ex-specific safety information for installation and operation in Ex areas. These safety instructions are part of the operating instructions manual and come with the Ex-approved instruments.

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1 About this document

1.1 Function

This operating instructions manual provides all the information you need for mounting, connection and setup as well as important instructions for maintenance and fault rectification. Please read this information before putting the instrument into operation and keep this manual accessible in the immediate vicinity of the device.

1.2 Target group

This operating instructions manual is directed to trained specialist personnel. The contents of this manual should be made available to these personnel and put into practice by them.

1.3 Symbols used

Information, tip, note
This symbol indicates helpful additional information.

Caution: If this warning is ignored, faults or malfunctions can result.

Warning: If this warning is ignored, injury to persons and/or serious damage to the instrument can result.

Danger: If this warning is ignored, serious injury to persons and/or destruction of the instrument can result.

Ex applications
This symbol indicates special instructions for Ex applications.

- **List**
  The dot set in front indicates a list with no implied sequence.

→ **Action**
This arrow indicates a single action.

1 **Sequence of actions**
Numbers set in front indicate successive steps in a procedure.

Battery disposal
This symbol indicates special information about the disposal of batteries and accumulators.

2 For your safety

2.1 Authorised personnel

All operations described in this operating instructions manual must be carried out only by trained specialist personnel authorised by the plant operator.

During work on and with the device the required personal protective equipment must always be worn.

2.2 Appropriate use

The VEGAMIP 62 is a sensor for point level detection.

You can find detailed information about the area of application in chapter "*Product description*".

Operational reliability is ensured only if the instrument is properly used according to the specifications in the operating instructions manual as well as possible supplementary instructions.

2.3 Warning about incorrect use

Inappropriate or incorrect use of the instrument can give rise to application-specific hazards, e.g. vessel overfill or damage to system components through incorrect mounting or adjustment.

2.4 General safety instructions

This is a state-of-the-art instrument complying with all prevailing regulations and guidelines. The instrument must only be operated in a technically flawless and reliable condition. The operator is responsible for the trouble-free operation of the instrument.

During the entire duration of use, the user is obliged to determine the compliance of the necessary occupational safety measures with the current valid rules and regulations and also take note of new regulations.

The safety instructions in this operating instructions manual, the national installation standards as well as the valid safety regulations and accident prevention rules must be observed by the user.

For safety and warranty reasons, any invasive work on the device beyond that described in the operating instructions manual may be carried out only by personnel authorised by the manufacturer. Arbitrary conversions or modifications are explicitly forbidden.

The safety approval markings and safety tips on the device must also be observed.

The emitting frequencies of the sensors depend on the model, but are all in the K band range. The low transmitting power lies far below the internationally permitted limit value. When the instrument is used correctly, it presents no danger to human health. It may be operated without restriction outside of closed vessels.

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2.5 CE conformity

The device fulfills the legal requirements of the applicable EC guidelines. By affixing the CE marking, VEGA confirms successful testing of the product.

Only with class A instruments:
The device is a class A instrument designed for use in an industrial environment. When used in a different environment, e.g., in a living area, the electromagnetic compatibility must be ensured by the user. If necessary, suitable screening measures against conducted and emitted disturbances must be taken.

You can find the conformity certificate in the download section under www.vega.com.

2.6 Radio license for Europe

The instrument is approved according to EN 300440-1 V1.5.1 (2009-03) and EN 300440-2 V1.531 (2009-03) and can be used without radio limitations.

2.7 Environmental instructions

Protection of the environment is one of our most important duties. That is why we have introduced an environment management system with the goal of continuously improving company environmental protection. The environment management system is certified according to DIN EN ISO 14001.

Please help us fulfill this obligation by observing the environmental instructions in this manual:

- Chapter "*Packaging, transport and storage*"
- Chapter "*Disposal*"

3 Product description

3.1 Configuration

Type label

The type label contains the most important data for identification and use of the instrument:

- Article number
- Serial number
- Technical data
- Article numbers, documentation

With the serial number, you can access the delivery data of the instrument via www.vega.com, "*VEGA Tools*" and "*serial number search*". You can find the serial number on the inside of the instrument as well as on the type label on the outside.

Serial number - Instrument search

The type label contains the serial number of the instrument. With it you can find the following instrument data on our homepage:

- Product code (HTML)
- Delivery date (HTML)
- Order-specific instrument features (HTML)
- Operating instructions and quick setup guide at the time of shipment (PDF)
- Order-specific sensor data for an electronics exchange (XML)
- Test certificate (PDF) - optional

Go to www.vega.com, "*VEGA Tools*" and "*Instrument search*". Enter the serial number.

Alternatively, you can access the data via your smartphone:

- Download the smartphone app "*VEGA Tools*" from the "*Apple App Store*" or the "*Google Play Store*"
- Scan the Data Matrix code on the type label of the instrument or
- Enter the serial number manually in the app

Scope of delivery

The scope of delivery typically consists of the following components.

- Point level sensor VEGAMIP R62 (receiving unit)
- External housing (processing unit)
- Documentation
  - this operating instructions manual
  - Supplementary instructions manual "*Plug connector for level sensors*" (optional)
  - Ex-specific "*Safety instructions*" (with Ex versions)
  - if necessary, further certificates
- The corresponding emitting unit VEGAMIP T61 is described in a separate operating instructions manual.

3.2 Principle of operation

Area of application

VEGAMIP 62 is a microwave barrier for level detection.

It is designed for industrial use in all areas of process technology and can be used in bulk solids and liquids.

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Typical applications are overfill and dry run protection. With an operating distance of 100 m, VEGAMIP 62 can be used, for example, in bulk solids silos with large diameters. Thanks to its simple and rugged measuring system, VEGAMIP 62 is virtually unaffected by the process and the chemical and physical properties of the medium.

VEGAMIP 62 can also be used for detection of vehicles and ships or for material recognition on conveyor belts.

It works even under extremely difficult conditions: different grain sizes, contamination, extreme filling noise, high temperatures, strong dust generation and abrasive products are all no problem for the instrument.

The VEGAMIP consists of an emitting unit VEGAMIP T61 and a receiving unit VEGAMIP R62 with external housing.

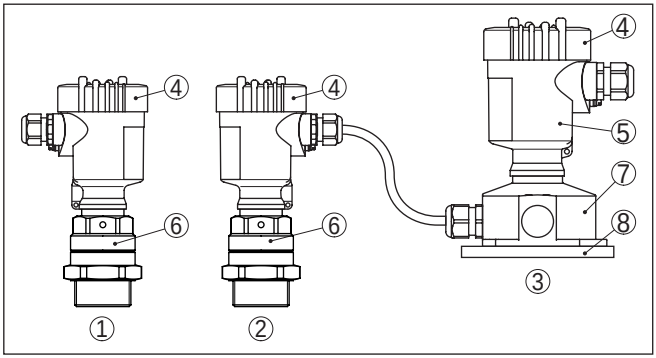

Fig. 1: VEGAMIP 62 with plastic housing

1 *Emitting unit VEGAMIP T61*
2 *Receiving unit VEGAMIP R62*
3 *External housing - VEGAMIP R62 (processing unit)*
4 *Housing lid*
5 *Housing with control electronics*
6 *Process fitting*
7 *Mounting socket*
8 *Wall mounting plate*

Several antenna versions are available for different applications.

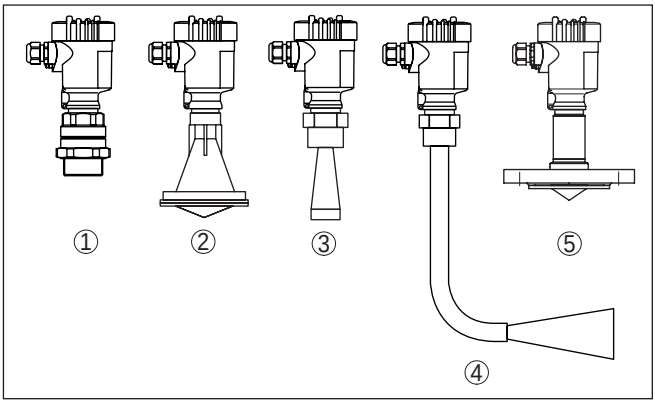

Fig. 2: Antenna versions

1 Threaded version - internal horn antenna with PTFE cover
2 Plastic encapsulated antenna with PP cover
3 Horn antenna/316L
4 VEGAMIP 62 with angled antenna extension
5 Encapsulated horn antenna with PTFE cover

Functional principle

The emitting unit transmits a focused microwave signal via horn antenna to the receiving unit on the opposite side. If there is medium between emitting and receiving unit, the signal is damped. This change is detected by the built-in electronics module and converted into a switching command.

3.3 Packaging, transport and storage

Packaging

Your instrument was protected by packaging during transport. Its capacity to handle normal loads during transport is assured by a test based on ISO 4180.

The packaging of standard instruments consists of environment-friendly, recyclable cardboard. For special versions, PE foam or PE foil is also used. Dispose of the packaging material via specialised recycling companies.

Transport

Transport must be carried out in due consideration of the notes on the transport packaging. Nonobservance of these instructions can cause damage to the device.

Transport inspection

The delivery must be checked for completeness and possible transit damage immediately at receipt. Ascertained transit damage or concealed defects must be appropriately dealt with.

Storage

Up to the time of installation, the packages must be left closed and stored according to the orientation and storage markings on the outside.

Unless otherwise indicated, the packages must be stored only under the following conditions:

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- Not in the open
- Dry and dust free
- Not exposed to corrosive media
- Protected against solar radiation
- Avoiding mechanical shock and vibration

Storage and transport temperature

- Storage and transport temperature see chapter "*Supplement - Technical data - Ambient conditions*"
- Relative humidity 20 … 85 %

3.4 Accessories and replacement parts

Protective cap

The protective cover protects the sensor housing against soiling and intense heat from solar radiation.

You will find additional information in the supplementary instructions manual "*Protective cover*" (Document-ID 34296).

Flanges

Screwed flanges are available in different versions according to the following standards: DIN 2501, EN 1092-1, BS 10, ANSI B 16.5, JIS B 2210-1984, GOST 12821-80.

You can find additional information in the supplementary instructions manual "*Flanges according to DIN-EN-ASME-JIS*" (Document-ID 31088).

Electronics module

The electronics module VEGAMIP R62 is a replacement part for microwave barriers of VEGAMIP series 60.

You will find additional information in the following operating instructions manual:

- "*Electronics module VEGAMIP R62 (receiving unit)*" (Document-ID 41982)

Mounting adapter

With high process temperatures exceeding 80 °C, you have to use a mounting adapter for the emitting and the receiving unit. The mounting adapter can only be used with the threaded version (internal horn antenna with PTFE cover).

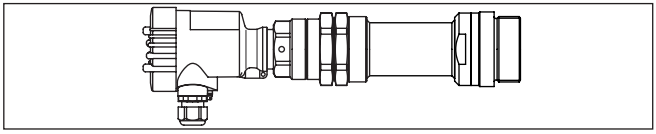

Fig. 3: VEGAMIP 62 with high temperature mounting adapter

4 Mounting

4.1 General instructions

Screwing in

On instruments with process fitting thread, the hexagon must be tightened with a suitable wrench. For the proper wrench size see chapter "*Dimensions*".

Warning:
The housing must not be used to screw the instrument in! Applying tightening force can damage internal parts of the housing.

Suitability for the process conditions

Make sure that all parts of the instrument exposed to the process are suitable for the existing process conditions.

These are mainly:

- Active measuring component
- Process fitting
- Process seal

Process conditions are particularly:

- Process pressure
- Process temperature
- Chemical properties of the medium
- Abrasion and mechanical influences

You can find detailed information on the process conditions in chapter "*Technical data*" as well as on the type label.

Protection against moisture

Protect your instrument against moisture ingress through the following measures:

- Use the recommended cable (see chapter "*Connecting to power supply*")
- Tighten the cable gland
- When mounting horizontally, turn the housing so that the cable gland points downward
- Loop the connection cable downward in front of the cable gland

This applies particularly to:

- Outdoor mounting
- Installations in areas where high humidity is expected (e.g. through cleaning processes)
- Installations on cooled or heated vessels

4.2 Mounting instructions

Switching point

If possible, install VEGAMIP 62 in a position where strong signal damping by the medium is expected.

Avoid mounting the instrument too close to the vessel wall. Reflections from the vessel wall or from vessel installation can influence the switching accuracy.

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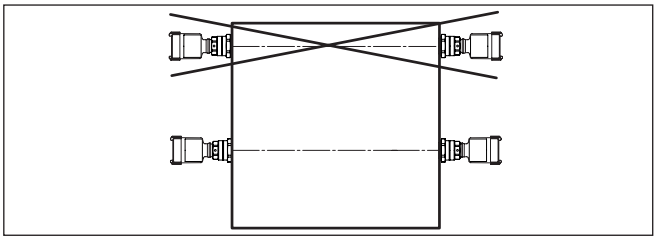


Fig. 4: Installation position (top view)

Product strength

The VEGAMIP 62 requires a minimum product strength to detect different products.

Dependent on the medium there will be a respective product thickness.

The properties of the medium are also dependent on the granulation size, the bulk density and the moisture content.

Some exemplary reference values for the min. strength of the medium:

Product type	Medium	Min. product strength
Plastic granules	PTFE, PS	> 1000 mm
	PP, PE, HDPE, POM	> 500 mm
	PA, PVC, PVDF	> 250 mm
Foodstuffs and wood	Flour	> 100 mm
	Cereals, corn, rice	> 100 mm
	Wood chips (dry)	> 500 mm
	Wood chips (moist)	> 100 mm
Mineral products / Ore	Stones (e.g. limestone)	> 100 mm
	Cement, clinker	> 100 mm
	Glass (crushed)	> 100 mm
	Coal	> 50 mm
	Bauxite	> 100 mm
	Ore	> 100 mm

Inflowing medium

If VEGAMIP 62 is mounted in the filling stream, unwanted false measurement signals can be generated. For this reason, mount VEGAMIP 62 at a position in the vessel where no disturbances, e.g. from filling openings, agitators, etc., can occur.

Non-metallic vessels

Microwaves can penetrate non-conductive materials. Hence, it is possible to measure through the wall of non-conductive vessels.

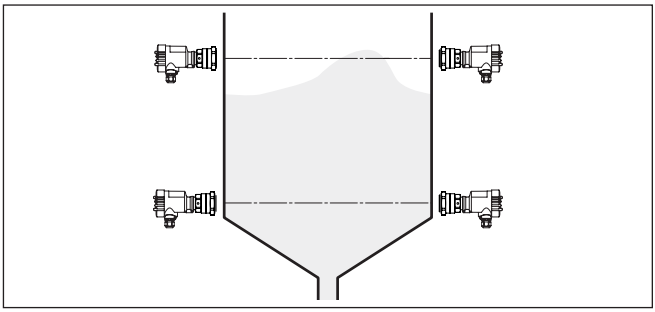


Fig. 5: Bulk solids vessel of plastic

Metal vessels

In metal vessels, you have to mount VEGAMIP 62 on flanges or threaded sockets. It is also possible to measure through a window. In general, all products such as glass, ceramic and plastic are suitable as window material.

Max. thickness of the window material:

Type of material	Window material	Max. thickness
Plastics	PTFE, PS	< 5000 mm
	PP, PE, HDPE, POM	< 1000 mm
	PA, PVC, PVDF	< 500 mm
	Rubber	< 50 mm
Glass or ceramic	Inspection glass	< 200 mm
	Aluminiumoxide ceramic Al_2O_3	< 200 mm
	Abrasion protection (ceramic)	< 100 mm
Isolating material	Mineral wool	< 1000 mm
	Ceramic fibre plates	< 1000 mm
	Fireclay bricks	< 500 mm

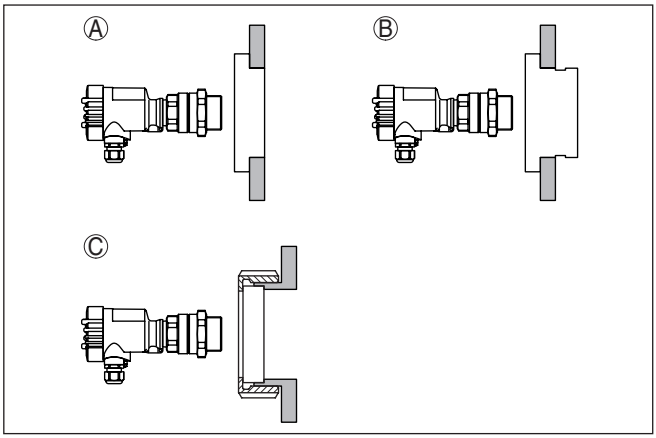


Fig. 6: Installation in front of a vessel window

A Window of non-conductive material, for example, glass, plastic, etc.
B Mounting with condensation on the inner wall of the vessel
C Inspection glass fitting

Concrete vessel

In general, the same as for metal vessels applies to concrete vessels due to the steel braining.

Wood vessels

In general, the same as for metal vessels applies to wood vessels due to the liquid absorption of the wood.

Pipelines

VEGAMIP 62 can be used for detection of products in pipelines. In pipelines of non-metallic products such as plastic or glass, the measured product can be detected through the pipe wall.

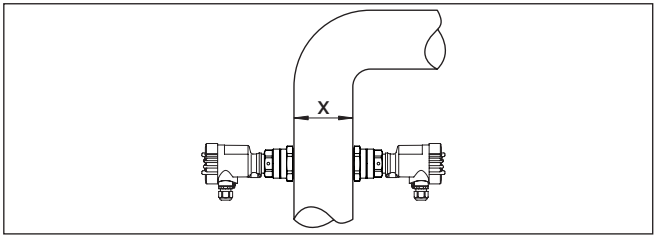


Fig. 7: Installation in pipelines

x Min. distance 100 mm (3.94 in)

Threaded version

Mount the threaded version of VEGAMIP 62 in the following way:

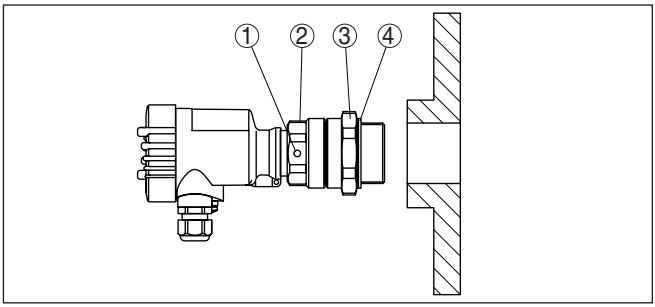


Fig. 8: VEGAMIP 62 - threaded version G1½

1 Polarisation marking
2 Instrument hexagon
3 Locknut
4 Process seal

1. Insert the supplied process seal (1) before screwing it in
2. To screw VEGAMIP 62 in, use the instrument hexagon (3) below the housing.

   Screw the instrument in and hand-screw it a flat wrench
3. Turn the sensor back (max. 180°) to reach the required orientation of the polarisation marking (4)
4. Hold the instrument in this position and tighten with the counter nut (2)

Caution:
The housing must not be used to screw the instrument in! Applying tightening force can damage internal parts of the housing.

Note:
In the case of VEGAMIP 62 with NPT thread, the instrument seals in the thread itself. Hence, no counter nut is necessary for these versions.

Buildup

Avoid long sockets in which the medium can remain and if possible, mount VEGAMIP 62 front-flush. This applies mainly if buildup and dust are expected.

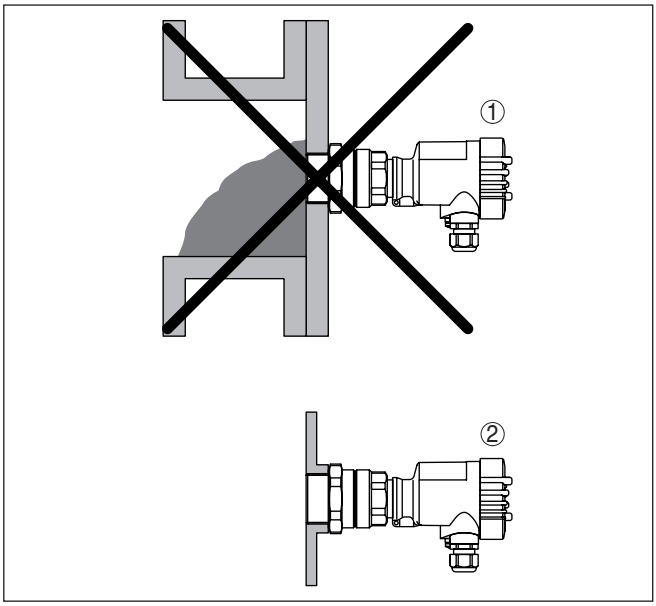


Fig. 9: Front flush installation

1 Unfavourable installation - bulk solid can settle in front of the sensor
2 Correct front flush installation

If a front-flush installation is not possible, you can fill long sockets with a plastic or ceramic cylinder to avoid build up of bulk solids and dust deposits. Select the material according to the diameter of the socket and adapt the length as far as possible to the shape of the vessel wall.

Secure the filling material against falling out or turning. If using a fixing screw is technically not possible, you can secure the material in the socket with an adhesive.

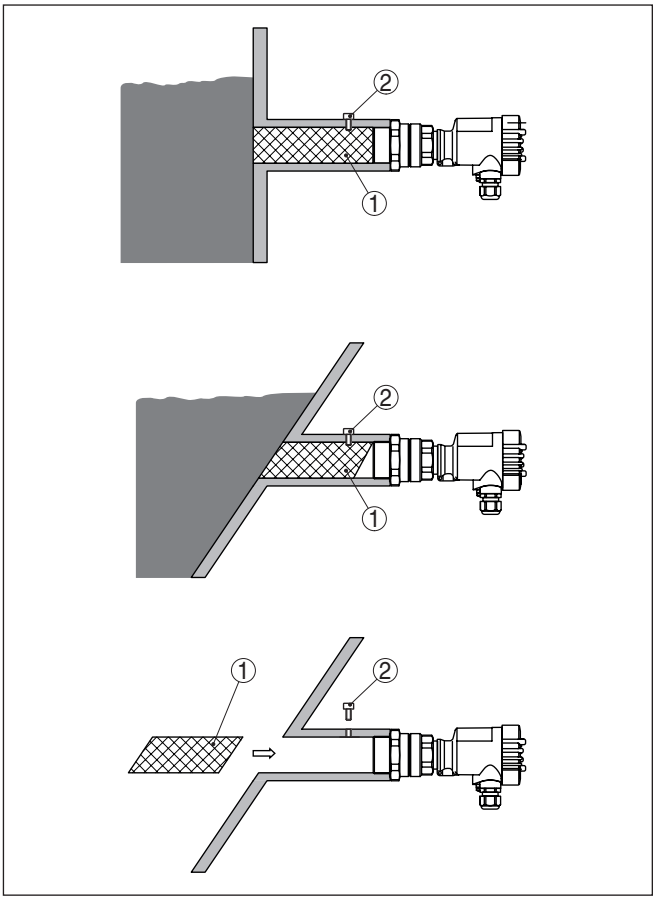


Fig. 10: Front flush installation

1 Plastic or ceramic material
2 Fixing screw (if technically possible)

Abrasive medium

In very abrasive products, VEGAMIP 62 should be installed with a mounting adapter or in front of a suitable window. In this case, you have to use a window material which is appropriately resistant.

Vibrations

In case of strong vessel vibrations, the VEGAMIP 62 should be mounted with anti vibration blocks or rubber buffers.

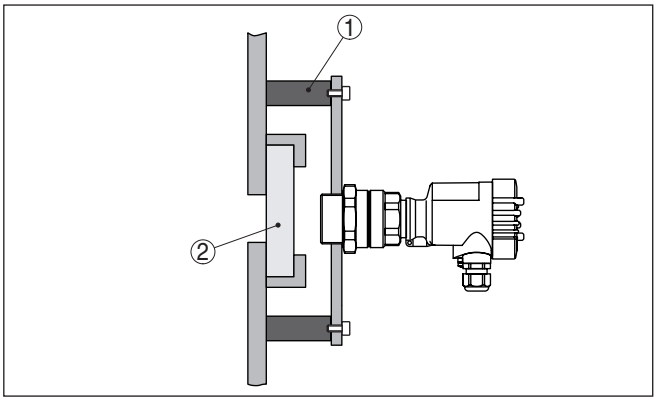


Fig. 11: Installation with vessel vibrations

1 Anti vibration blocks or rubber buffers
2 Window of non-conductive material, for example, glass, plastic, etc.

Orientation of the sensor

Angle

For an optimum switching signal, the two sensors must be adapted to each other. The accuracy must be in a range of ±5°.

Axis offset

The axis of the two sensors can have an offset of up to < 5 % of the sensor distance (d) to each other. Example: with a sensor distance of 1000 mm, the two sensors must have an offset of max. 50 mm to each other.

General rule: the bigger the antenna and the better it focusses, the more precise the orientation has to be.

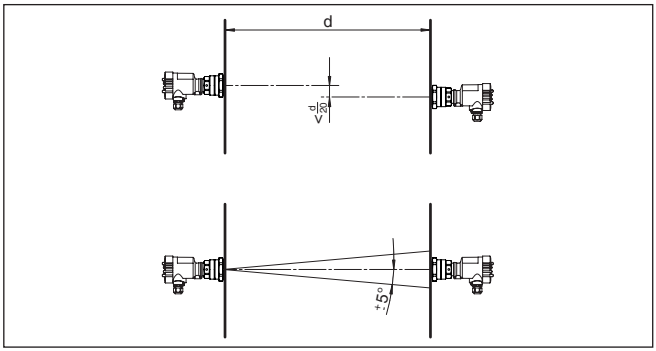


Fig. 12: Orientation of the sensors - Angle and axis offset

Polarisation direction

The emitting unit emits electromagnetic waves. The polarisation plane is the direction of the electrical wave component. Its position is marked on the instrument hexagon by polarisation markings.

For a reliable function, the emitting and receiving unit must be installed in the same polarisation direction.

If several instrument pairs are installed in a vessel, the instrument pairs can be coded by different polarisation positions to avoid that they influence one another.

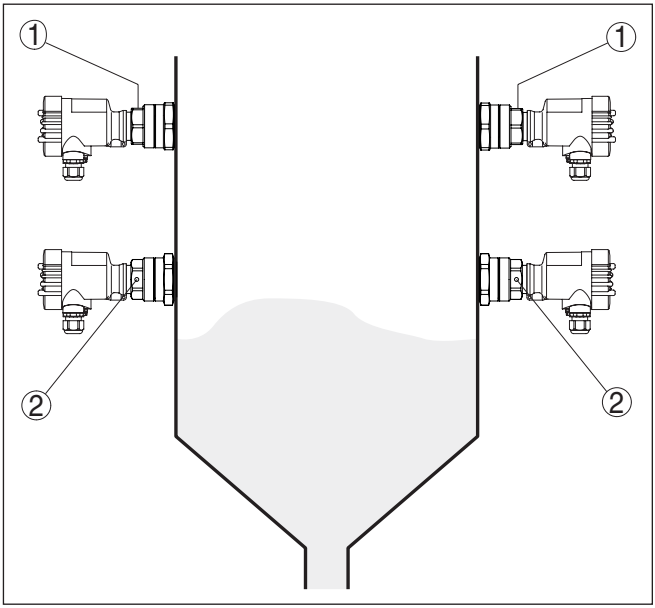


Fig. 13: Orientation according to the polarisation direction

1 Polarisation marking on top
2 Polarisation marking on the side

Special mounting options

In tight mounting spaces or spaces subject to high temperatures, the signal of VEGAMIP 62 can be guided via a deflector. You can use a metal plate for this or an angled antenna extension. This deflector can be positioned on the emitting unit side or on the receiving unit side.

In products with low dielectric value, we recommend using an instrument version with antenna extension because it focusses the signal optimally and has no signal loss. With instrument versions with detachable horn antenna, the antenna extension can be retrofitted.

To minimize false echoes, take note of the polarisation level. Keep the position of the polarisation marking to the antenna extension in mind. Mount the antenna extension according to the following illustration.

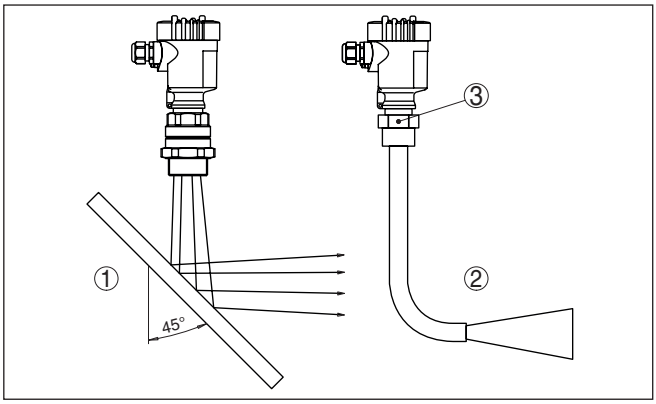


Fig. 14: Possibilities for signal deflection

1 Metal plate for signal deflection of the microwave signal
2 Bent antenna extension
3 Polarisation marking

Wall mounting - External housing

1. Mark the holes according to the following drilling template
2. Depending on the mounting surface, fasten the wall mounting plate with 4 screws

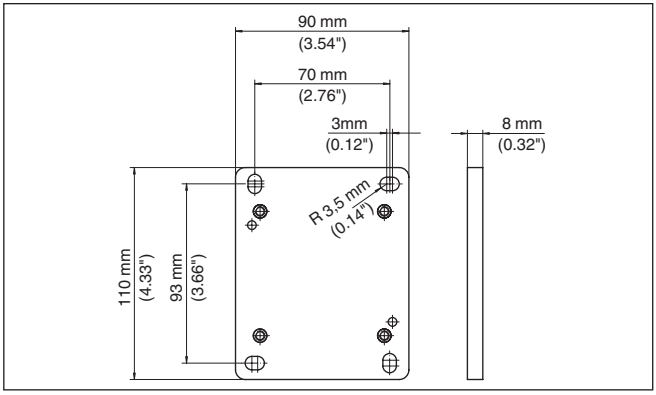


Fig. 15: Hole pattern - wall mounting plate (external housing)

Tip:
Mount the wall mounting plate in such a way that the cable gland of the base points downward. Rain and condensation water can thus drain off.

The base of stainless steel can be displaced in 90° increments on the wall mounting plate, the base of plastic by 180°.

Turn the cable gland of the electronics housing downward. The housing can be turned by 330° without the use of any tools.

Warning:
With the plastic housing, the four screws of the base may only be screwed in hand tight. Exceeding the max. torque specified in chapter "*Technical data*" can damage the wall mounting plate.

5 Connecting to power supply

5.1 Preparing the connection

Safety instructions

Always keep in mind the following safety instructions:

Warning:
Connect only in the complete absence of line voltage.

- The electrical connection must only be carried out by trained personnel authorised by the plant operator.
- If overvoltage surges are expected, overvoltage arresters should be installed.

Voltage supply

Connect the operating voltage according to the connection diagrams. The electronics module is designed in protection class I. To maintain this protection class, it is absolutely necessary that the earth conductor be connected to the inner earth conductor terminal. Keep the general installation regulations in mind. Take note of the corresponding installation regulations for hazardous areas with Ex applications.

The data for power supply are specified in chapter "*Technical data*".

Connection cable

The instrument is connected with standard three-wire cable without screen. If electromagnetic interference is expected which is above the test values of EN 61326 for industrial areas, screened cable should be used.

Use cable with round cross section for instruments with housing and cable gland. To ensure the seal effect of the cable gland (IP protection rating), find out which cable outer diameter the cable gland is suitable for.

Use a cable gland fitting the cable diameter.

Cover all housing openings conforming to standard according to EN 60079-1.

5.2 Connection procedure

Connection technology

The voltage supply and signal output are connected via the spring-loaded terminals in the housing.

Optionally you can order a preconfectioned cable in different lengths. The colour specification in the following illustrations refer to these confectioned cables.

Connection procedure

Proceed as follows:

1. Unscrew the housing cover
2. Loosen compression nut of the cable entry gland
3. Remove approx. 10 cm (4 in) of the cable mantle, strip approx. 1 cm (0.4 in) of insulation from the ends of the individual wires
4. Insert the cable into the sensor through the cable entry

Fig. 16: Connection steps 4 and 5

5. Insert the wire ends into the terminals according to the wiring plan

Information:
Solid cores as well as flexible cores with wire end sleeves are inserted directly into the terminal openings. In case of flexible cores without end sleeves, press the terminal with a small screwdriver; the terminal opening is freed. When the screwdriver is released, the terminal closes again.

6. Check the hold of the wires in the terminals by lightly pulling on them
7. Connect the screen to the internal ground terminal, connect the outer ground terminal to potential equalisation
8. Tighten the compression nut of the cable entry gland. The seal ring must completely encircle the cable
9. Screw the housing cover back on

The electrical connection is finished.

Information:
The terminal block is pluggable and can be removed from the electronics. To do this, lift the terminal block with a small screwdriver and pull it out. When reinserting the terminal block, you should hear it snap in.

Connection steps - external housing

Proceed as follows:

1. Loosen the four screws on the housing socket with an Allen key
2. Remove the mounting plate from the housing socket

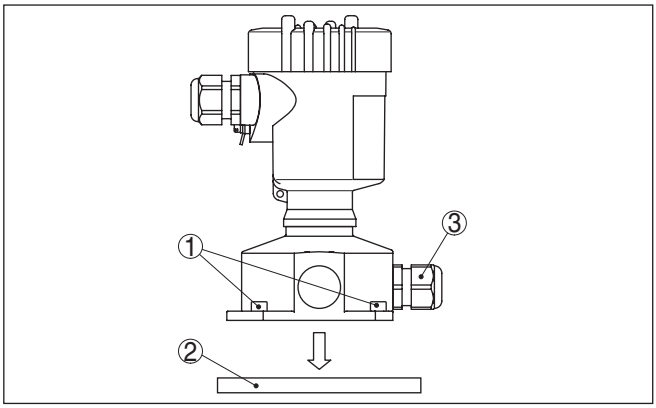


Fig. 17: Removing the mounting plate on the housing socket

1 Screws
2 Wall mounting plate
3 Cable gland

3. Loop the connection cable through the cable entry on the housing base

Tip:
The cable gland can be mounted in three positions each displaced by 90°. Simply exchange the cable gland against the blind plug in the suitable thread opening.

4. Connect the wire ends as described in chapter "*Connection plan*". Take note of the numbering.
5. Connect the screen to the internal ground terminal, connect the outer ground terminal above on the housing to potential equalisation
6. Tighten the compression nut of the cable entry gland. The seal ring must completely encircle the cable
7. Place housing with base back on the mounting plate and tighten the screws

The electrical connection of the sensor to the external housing is finished.

5.3 Wiring plan receiving unit

Wiring plan - external housing (socket)

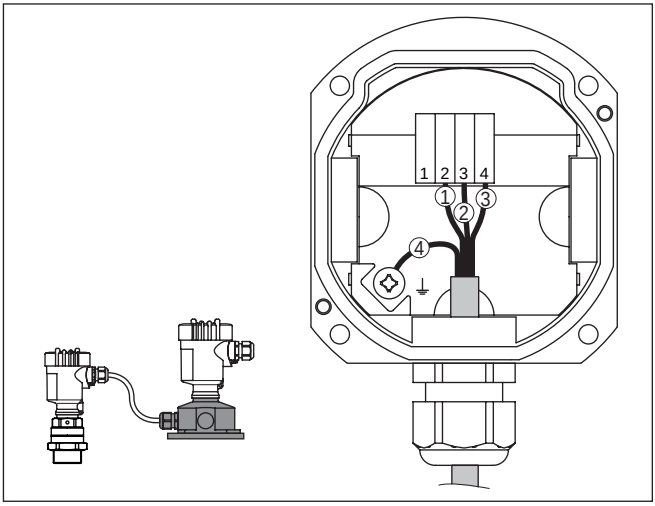


Fig. 18: Connection of the sensor in the housing base (external housing)

1 *White (terminal 2)*
2 *Brown (terminal 3)*
3 *Blue (terminal 4)*
4 *Shielding*

Wiring plan - Sensor housing

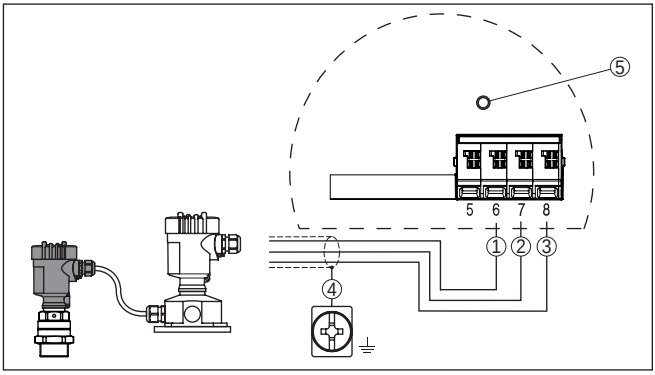


Fig. 19: Connection of the cable to the external housing (processing unit)

1 *White (terminal 6)*
2 *Brown (terminal 7)*
3 *Blue (terminal 8)*
4 *Shielding*
5 *Control lamp (LED) - Voltage supply*

Wiring plan - processing unit

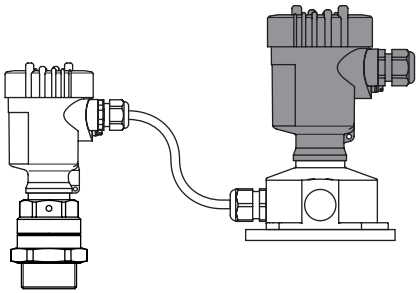


Fig. 20: The electronics is located in the housing of the processing unit

We recommend connecting VEGAMIP 62 in such a way that the switching circuit is open when there is a level signal, line break or failure (safe state).

Information:
The relays are always shown in non-operative condition.

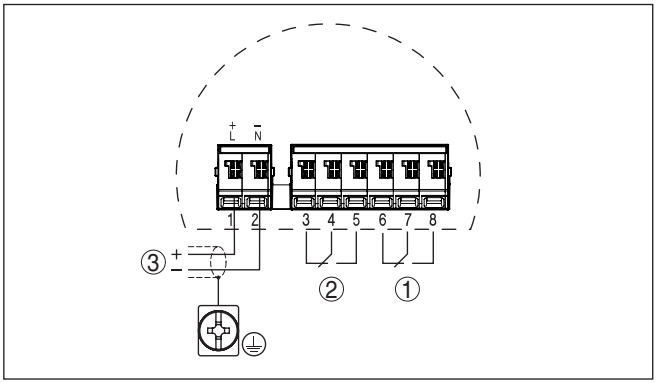


Fig. 21: Wiring plan processing unit - VEGAMIP 62 (receiver)

1 Relay output
2 Relay output
3 Voltage supply

Connection to a PLC

When connecting to a PLC, the min. switching capacity of the relay must be taken into account.

If ncecssary, a correspondingly dimensioned resistor must be connected in parallel to the PLC input. With a voltage U_B von 24 V and a PLC inner resistance R_i > 100 kΩ, the additional load resistance R_L must be between 6.8 and 8.2 kΩ.

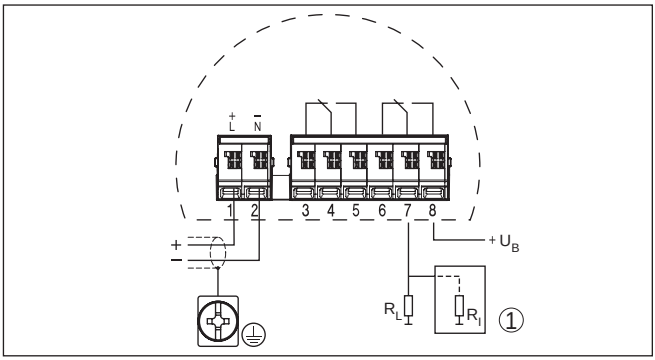


Fig. 22: Wiring plan processing unit - VEGAMIP 62 (receiver) when connecting to a PLC

1 PLC/process control system
R_I Internal resistance of the PLC
R_L Additional load resistance (6.8 … 8.2 kΩ)
U_B Voltage supply

6 Setup

6.1 Adjustment elements

The figures in brackets refer to the following illustration.

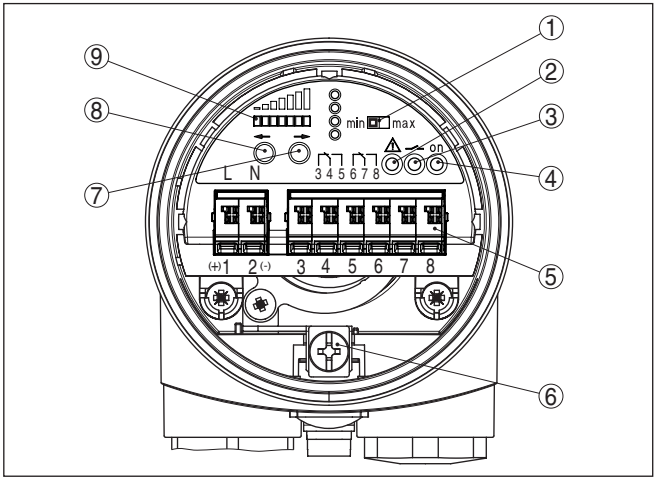


Fig. 23: Electronics module MP6X R (receiving unit) - Relay output

1 *Mode switch for selecting the switching behaviour (min./max.)*
2 *Control lamp (LED) for indication of a fault (red)*
3 *Signal lamp (LED) for indication of the switching status (yellow)*
4 *Control lamp (LED) for indication of the instrument function (green)*
5 *Connection terminals*
6 *Ground terminal*
7 *Key for adjustment of the sensitivity and the switching delay (-->)*
8 *Key for adjustment of the sensitivity and the switching delay (<--)*
9 *LED indicating board for indication of reception strength (yellow)*

Signal lamps (2, 3, 4)

There are three control lamps (LED) on the electronics module

Control lamp (red) for indication of a fault (2)
This signal lamp shows the fault status of the instrument.

Control lamp (yellow) for indication of the switching condition (3)
The signal lamp signals the switching condition of the switching output.

Control lamp (green) for indication of the instrument function (4)
The green signal lamp (on) shows the operating state of the instrument as soon as voltage supply is connected correctly.

Mode switch (1)

With the mode switch (max./min.) you can change the switching status of the relay. You can set the required mode according to the "*Function chart*" (max. - maximum detection or overflow protection, min. - minimum detection or dry run protection).

Sensitivity adjustment (7, 8)

With these keys (7 and 8) you can adjust the switching point to the medium.

Depending on the process, the sensitivity of VEGAMIP 62 must be set higher or lower.

Pressing the "<--" key makes the sensor more sensitive. Pressing the "-->" key makes the sensor less sensitive.

You can also adjust the switching delay with the two keys.

LED indication strip - receive level (9)

By means of the LED indicating strip, you can see the actual receive level during adjustment.

When the indication moves to the right, the instrument is less sensitive, to the left more sensitive.

6.2 Adjustment

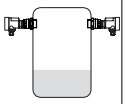
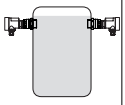
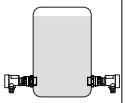
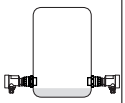
Prerequisites

The microwave barrier can only be adjusted when it is uncovered. Make sure that no measured medium or vessel installations are between the emitting and receiving unit.

Mode

Select the requested mode (min./max.) according to the function chart.

The following function chart provides an overview of the switching statuses depending on the set mode and level.

	Level	Switching status	Signal lamp - Relay (yellow)
Mode max. Overflow protection		 Relay energized	
Mode max. Overflow protection		 Relay deenergized	
Mode min. Dry run protection		 Relay energized	
Mode min. Dry run protection		 Relay deenergized	

	Level	Switching status	Signal lamp - Relay (yellow)
Failure of the supply voltage (max./min. mode)	any	 Relay deenergized	○
Fault	any	 Relay deenergized	○ Red fault LED lights up

Depending on the switching function your relay output should carry out, you can determine the switching direction by means of the slide switch.

- For maximum indication or overfill protection set the slide switch to position max.
- For minimum indication or dry run protection, set the slide switch to position min.

The relay is energized if the yellow relay control lamp lights.

Sensitivity adjustment

With the two keys you can change the LED indication strip and adjust the switching point to the medium.

The keys are recessed to avoid unintentional changes of the settings. To make an adjustment, use eg a small screwdriver.

If you press one of the keys for more than two seconds, the adjustment range shifts automatically in the respective direction. The greater the distance between emitting and receiving unit, the greater the adjustment range of the indication. The LED indication strip always shows a small section of the actual measuring range.

Pressing the "<--" key makes the sensor more sensitive. Pressing the "-->" key makes the sensor less sensitive.

Press the respective key until the indication is within the LED indication strip. This means one or two LEDs on the LED indication strip will light up.

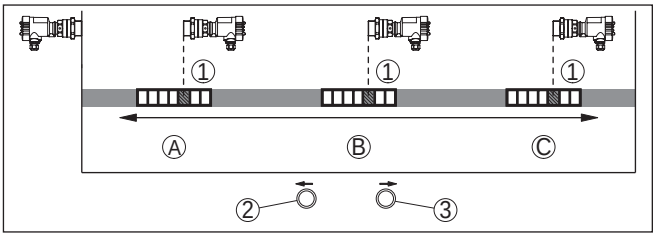


Fig. 40: Indication strip

1 Indication (LED indication strip)
2 More sensitive - Key to the left
3 Less sensitive - Key to the right
A Medium: Plastics (PP, PVC …), solvents
B Medium: Building materials (sand, stones …)
C Medium: Conductive substances (coal, ore, salt …)

Set the indication approximately to the middle of the LED indicating board until the yellow relay control lamp changes status.

Depending on the vessel size, process and/or medium, you have to adjust the sensitivity of VEGAMIP 62 to more or less sensitive. In products with weak signal damping, in small vessels or pipelines or with buildup, it might be necessary to test the switching function.

Receive level

By means of the LED indicating strip, you can see the actual receive level during adjustment.

When the indication moves to the right, the instrument is less sensitive, to the left more sensitive.

Medium provides good signal damping

In applications with products providing good signal damping (for example rocks, ore, sand, cement) and where buildup and contamination is expected, you should adjust the instrument to more insensitive. In this case, the VEGAMIP 62 switches only when there is a relatively strong signal damping by the medium. Buildup does not influence the measurement.

In case of buildup, press the key (to the right) until the flashing LEDs are at the right edge of the LED indicating strip. For strong buildup, you can press the key several times to make the instrument less sensitive. The indication of the LED indicating strip does not change, but the instrument will become a little less sensitive with each pressing of the key.

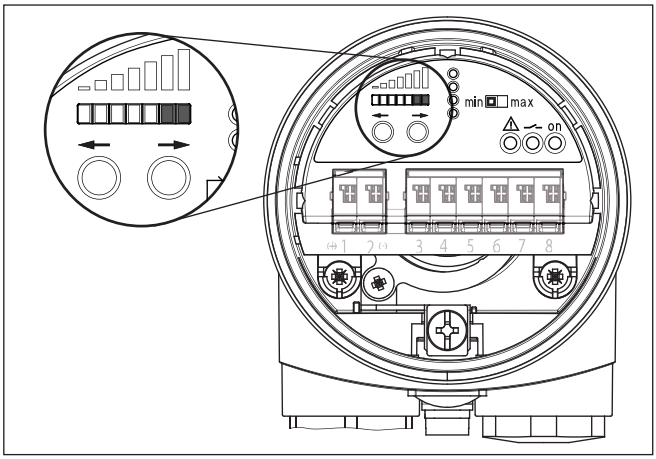


Fig. 41: LED indication strip - Setting for products with strong signal damping

If there is strong buildup during operation, adjustment with buildup is recommended. A short period of operation is probably sufficient to create buildup, or buildup can be created artifically or imitated.

Product provides little signal damping

In applications with products providing only weak signal damping (eg plastic granules, cereals), you should adjust the instrument to more sensitive. This way, the VEGAMIP 62 switches very sensitively, even with a relatively low coverage by the product.

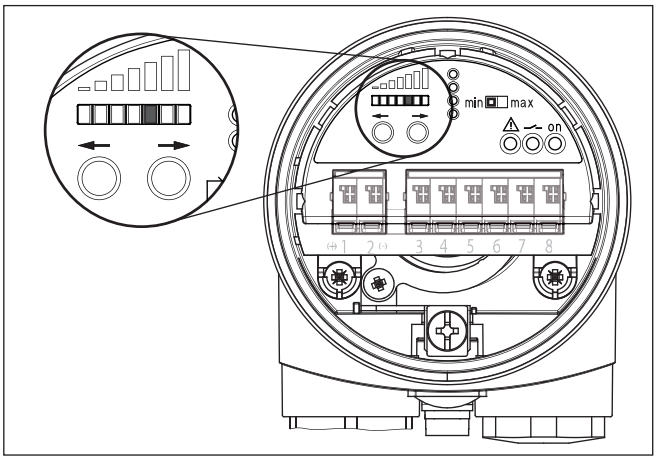


Fig. 42: LED indicating strip - Setting for products with weak signal damping

Switching delay

You can adjust the switching delay with the help of the LED indicating strip.

Push the two keys (7) and (8) simultaneously for approximately 2 s until the LED indication flashes.

With the two keys you can select the requested switching delay according to the following illustration.

The switching delay can be adjusted in seven steps between 100 ms and 20 s.

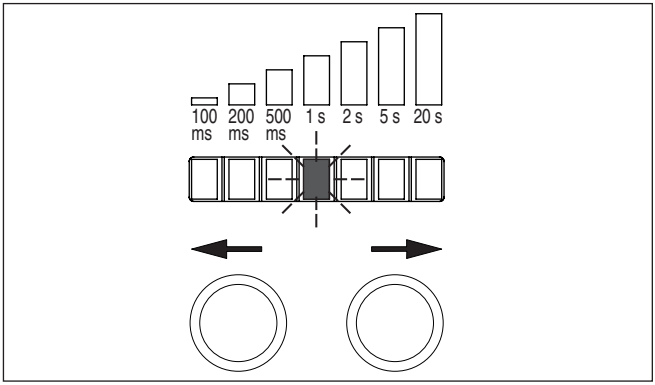


Fig. 43: Adjust switching delay - LED indication flashes

If the indication moves to the right, the switching delay will be longer, to the left shorter.

The indication returns automatically to the indication of the actual receive level after approximately 10 s.

Simulation

If possible, simulate a filling between emitting and receiving unit with your hand or a metal sheet and check if the switching point is adjusted correctly. If the control lamp changes its switching status, the switching function is correct.

7 Maintenance and fault rectification

7.1 Maintenance

If the device is used correctly, no maintenance is required in normal operation.

7.2 Rectify faults

Reaction when malfunctions occur

The operator of the system is responsible for taking suitable measures to rectify faults.

Fault rectification

The first measure to take is to check the output signal. In many cases, the causes can be determined this way and the faults quickly rectified.

Checking the switching signal

Error	Cause	Rectification
VEGAMIP 62 signals "covered" without being submerged (overfill protection) or VEGAMIP 62 signals "uncovered" when being submerged (dry run protection)	Operating voltage too low	Check operating voltage
	Buildup on the sensor	Check if there is buildup on the two sensors, and if so, remove it.
	Wrong mode selected	Set the correct mode on the mode switch (max.: overflow protection, min.: dry run protection). Wiring should be carried out according to the idle current principle.
	Unfavourable installation location	Mount the sensor (emitter/receiver) in a position where there is a lot of measured product between emitting and receiving unit.
		Mount the sensor (emitter/receiver) in a psoition where there are no interfering installations or moving parts.
	Electronics defective	Press the mode switch. If the instrument then does not change the mode, the electronics module may be defective. Exchange the electronics module.
	Sensor defective	Operate the mode switch (min./max.). If the instrument then switches mode, the sensor may be covered with buildup or mechanically damaged. If the switching function in the correct mode is faulty, return the instrument for repair.
Signal lamp lights red	Operating voltage too low	Check operating voltage
	Electronics module has detected an internal malfunction	Exchange the instrument or send it in for repair
Instrument switches delayed	Check switching delay	Adjust switching delay correctly
Instrument switches frequently with certain levels	Wave movements in the vessel	Adjust or increase switching delay
	Effects through interfering reflections	Adjust the instrument to less sensitive

Reaction after fault rectification

Depending on the reason for the fault and the measures taken, the steps described in chapter "*Setup*" must be carried out again or must be checked for plausibility and completeness.

24 hour service hotline

Should these measures not be successful, please call in urgent cases the VEGA service hotline under the phone no. **+49 1805 858550**.

The hotline is also available outside normal working hours, seven days a week around the clock.

Since we offer this service worldwide, the support is provided in English. The service itself is free of charge, the only costs involved are the normal call charges.

7.3 Exchanging the electronics

If the electronics module is defective, it can be replaced by the user.

In Ex applications only an electronics module with respective Ex approval may be used.

You can find all the information you need to carry out an electronics exchange in the handbook of the new electronics module.

7.4 How to proceed if a repair is needed

You can find a repair form as well as detailed information on how to proceed at www.vega.com/downloads and "*Forms and certificates*".

By doing this you help us carry out the repair quickly and without having to call back for needed information.

If a repair is necessary, please proceed as follows:

- Print and fill out one form per instrument
- Clean the instrument and pack it damage-proof
- Attach the completed form and, if need be, also a safety data sheet outside on the packaging
- Please contact the agency serving you to get the address for the return shipment. You can find the agency on our home page www.vega.com.

8 Dismount

8.1 Dismounting steps

Warning:
Before dismounting, be aware of dangerous process conditions such as e.g. pressure in the vessel or pipeline, high temperatures, corrosive or toxic products etc.

Take note of chapters "*Mounting*" and "*Connecting to power supply*" and carry out the listed steps in reverse order.

8.2 Disposal

The instrument consists of materials which can be recycled by specialised recycling companies. We use recyclable materials and have designed the parts to be easily separable.

Correct disposal avoids negative effects on humans and the environment and ensures recycling of useful raw materials.

Materials: see chapter "*Technical data*"

If you have no way to dispose of the old instrument properly, please contact us concerning return and disposal.

WEEE directive 2002/96/EG
This instrument is not subject to the WEEE directive 2002/96/EG and the respective national laws. Pass the instrument directly on to a specialised recycling company and do not use the municipal collecting points. These may be used only for privately used products according to the WEEE directive.

9 Supplement

9.1 Technical data

General data

Material 316L corresponds to 1.4404 or 1.4435

Materials, wetted parts

- Process fitting - thread 316L
- Process fitting - flange 316L

Antenna	Instrument seal	Cover or wetted materials
Threaded version - internal horn antenna with PTFE cover	FKM (A+P 70.16.-06) Process seal: Klingersil C-4400	PTFE 316L
Plastic encapsulated antenna with PP cover	-	PP
Horn antenna/316L	FKM (SHS FDM 70C3 GLT) FFKM (Kalrez 6375) Process seal: Klingersil C-4400	PTFE 316L
Encapsulated horn antenna with PTFE cover	-	PTFE
Mounting adapter (option)	Graphite	Al_2O_3 ceramic 316L

Materials, non-wetted parts

- Plastic housing plastic PBT (Polyester)
- Aluminium die-casting housing Aluminium die-casting AlSi10Mg, powder-coated - basis: Polyester
- Stainless steel housing - precision casting 316L
- Stainless steel housing, electropolished 316L
- Seal between housing and housing cover NBR (stainless steel housing, precision casting), silicone (aluminium/plastic housing; stainless steel housing, electropolished)
- Ground terminal 316L
- Mounting adapter (option) 316L

Materials - External housing

- Housing Plastic PBT (polyester), Alu die-casting powder-coated, 316L
- Housing base plastic PBT (Polyester)
- Wall mounting plate plastic PBT (Polyester)
- Seal between housing socket and wall mounting plate TPE (fixed connected)
- Seal between housing and housing cover NBR (stainless steel housing), silicone (Alu/plastic housing)

– Ground terminal	316L
Sensor length	See chapter "*Dimensions*"
Weight	
– Instrument weight (depending on process fitting)	0.8 … 4 kg (0.18 … 8.82 lbs)
– Weight - External housing	0.7 … 1.5 kg (1.543 … 3.307 lbs), depending on housing material
Process fittings	
– Pipe thread, cylindrical (ISO 228 T1)	G1½
– American pipe thread, conically	1½ NPT
– Flanges	DIN from DN 50, ASME from 2"
– Mounting adapter	G2 or 2 NPT
Frequency range	K band, 24.085 GHz (ISM band)
Measuring range	0.1 … 100 m (0.33 … 328 ft)
Beam angle[1)]	
– Threaded version - internal horn antenna (PTFE cover)	20 °
– Plastic encapsulated antenna with PP cover	10 °
– Horn antenna (316L) - ø 40 mm (1.575 in)	22 °
– Horn antenna (316L) - ø 48 mm (1.89 in)	18 °
– Encapsulated antenna with PTFE cover - Flange DN 50, ASME 2"	18 °
– Encapsulated antenna with PTFE cover - Flange DN 80 … DN 150, ASME 3" … 6"	10 °

Output variable

Output	Relay output (DPDT), 2 floating spdts
Switching voltage max.	253 V AC, 253 V DC
Switching current max.	5 A AC, 1 A DC
Breaking capacity	
– Min.	50 mW
– Max.	750 VA AC (cos phi > 0.5), 40 W DC (ohmic load)
	If inductive loads or stronger currents are switched through, the gold plating on the relay contact surface will be permanently damaged. The contact is then no longer suitable for switching low-level signal circuits.
Contact material (relay contacts)	AgNi (Au plated) or AgSnO (Au plated)

1) Outside the specified beam angle, the energy of the radar signal has a level of -3 dB (50 %)

Modes (switchable)	
– max.	Max. detection or overflow/overfill protection
– min.	Min. detection or dry run protection

Measuring accuracy

Hysteresis	approximately 1 dB
Switching delay	adjustable from 0.1 … 20 s (on/off)
Min. distance	100 mm (3.94 in)

Ambient conditions

Ambient, storage and transport temperature	-40 … +80 °C (-40 … +176 °F)

Process conditions

Measured variable	Limit level of bulk solids and liquids
Process pressure[2)]	
– VEGAMIP 62, threaded version - internal horn antenna with PTFE cover	-1 … 4 bar/-100 … 400 kPa (-14.5 … 58 psig)
– VEGAMIP 62, plastic encapsulated antenna with PP cover	-1 … 2 bar/-100 … 200 kPa (-14.5 … 29 psig)
– VEGAMIP 62, horn antenna/316L	-1 … 40 bar/-100 … 4000 kPa (-14.5 … 580 psig)
– VEGAMIP 62, encapsulated horn antenna with PTFE cover	-1 … 16 bar/-100 … 1600 kPa (-14.5 … 232 psig)
– VEGAMIP 62 with mounting adapter	unpressurized (IP 67)
Process temperature (thread or flange temperature)	
– VEGAMIP 62, threaded version - internal horn antenna with PTFE cover	-40 … +80 °C (-40 … +176 °F)
– VEGAMIP 62, plastic encapsulated antenna with PP cover	-40 … +80 °C (-40 … +176 °F)
– VEGAMIP 62, horn antenna/316L - seal: FKM (SHS FDM 70C3 GLT)	-40 … +130 °C (-40 … +266 °F)
– VEGAMIP 62, horn antenna/316L - seal: FFKM (Kalrez 6375)	-20 … +130 °C (-4 … +266 °F)
– VEGAMIP 62, encapsulated horn antenna with PTFE cover	-40 … +200 °C (-40 … +392 °F)
– VEGAMIP 62 with mounting adapter 150 mm (optional)	-40 … +250 °C (-40 … +482 °F)
– VEGAMIP 62 with mounting adapter 300 mm (optional)	-40 … +450 °C (-40 … +842 °F)

[2)] Note max. pressure of the process fitting

Electromechanical data	
Cable entry/plug[3]- instrument housing	
– Single chamber housing	– M20 x 1.5 or ½ NPT
Cable entry/plug - external housing	
– Housing base	– Cable gland M20 x 1.5
– Housing	– M20 x 1.5 or ½ NPT
Spring-loaded terminals	for wire cross-section up to 1.5 mm² (AWG 16)
Connection cable to external housing	
– Configuration	Three wires, double screening, weather-resistant
– Material	PUR UL94-V0
– Wire cross-section	0.34 mm² (AWG 22)
– Wire resistance	< 0.060 Ω/m (0.018 Ω/ft)
– Capacitance - screen	≤ 250 pF/m
– Max. length	25 m (82 ft)
– Min. bending radius at 25 °C/77 °F	25 mm (0.985 in)
– Diameter approx.	7 mm (0.276 in)
– Colour	Black

Voltage supply	
Operating voltage	20 … 253 V AC, 50/60 Hz, 20 … 72 V DC (at U >60 V DC, the ambient temperature can be max. 50 °C/122 °F)
Power consumption	2.5 VA (AC), approx. 1.3 W (DC)

Electrical protective measures	
Protection rating	
– Instrument housing	IP 66/IP 67 (NEMA 4X)
– External housing	IP 65
– Housing base - external housing	IP 68 (1 bar), NEMA 6P
Overvoltage category	III
Protection class	I

Approvals

Instruments with approvals can have different technical specifications depending on the version.

For that reason the associated approval documents of these instruments have to be carefully noted. They are part of the delivery or can be downloaded under www.vega.com, "*VEGA Tools*" and "*Instrument search*" as well as under www.vega.com/downloads and "*Approvals*".

[3] depending on the version

9.2 Dimensions

VEGAMIP 62, housing versions

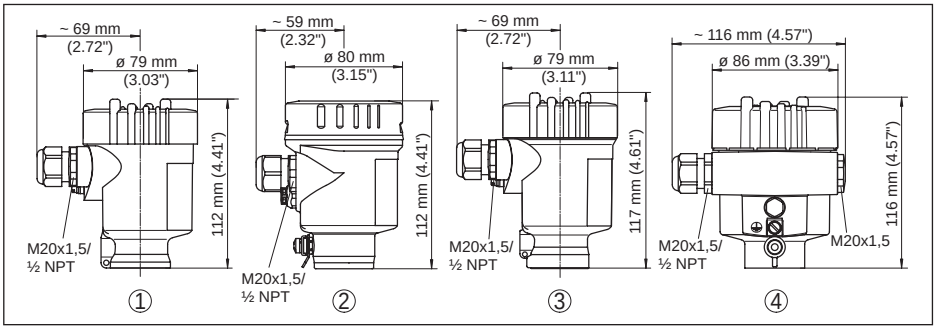


Fig. 44: Housing versions, for instrument housing and external housing

1 *Plastic housing*
2 *Stainless steel housing, electropolished*
3 *Stainless steel housing, precision casting*
4 *Aluminium housing*

External housing

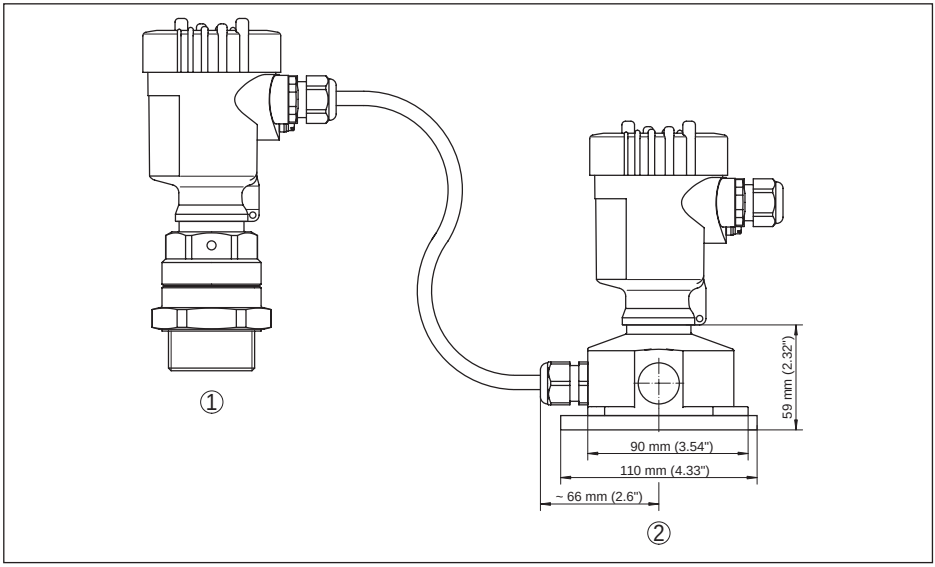


Fig. 45: External housing, receiving unit

1 *Instrument housing*
2 *External housing*

VEGAMIP 62

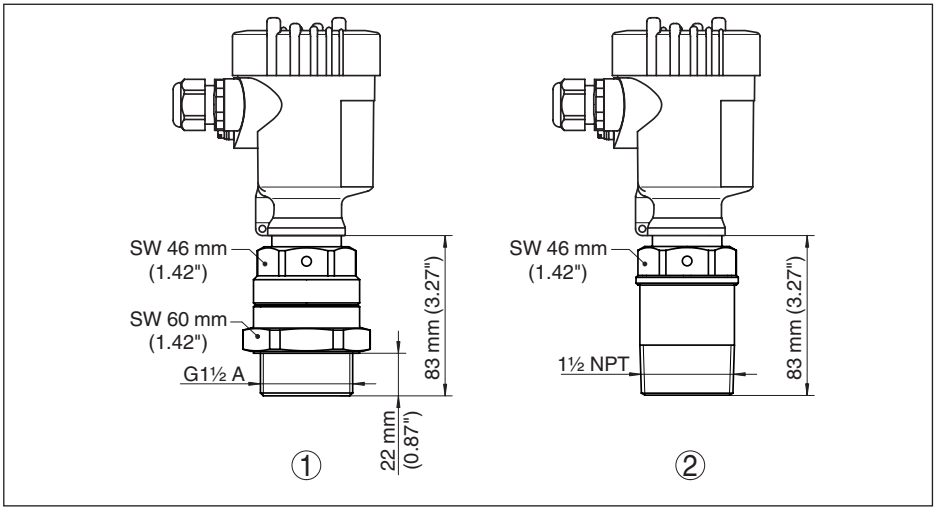


Fig. 46: VEGAMIP 62, internal horn antenna (threaded version)

1 Internal horn antenna with PTFE cover, threaded version G1½
2 Internal horn antenna with PTFE cover, threaded version 1½ NPT

VEGAMIP 62

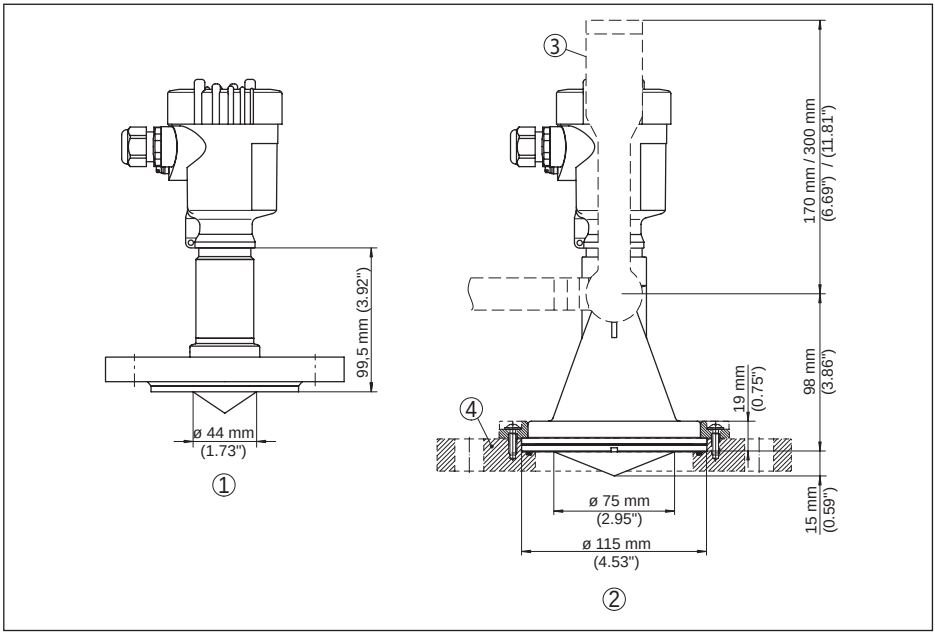
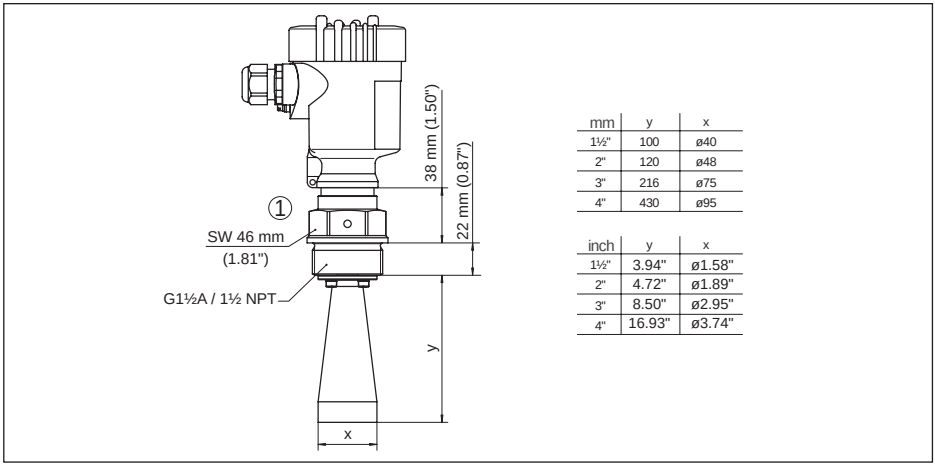


Fig. 47: VEGAMIP 62, encapsulated antennas

1 *Encapsulated horn antenna with PTFE cover, flange version*
2 *Plastic encapsulated antenna with PP cover*
3 *Mounting strap*
4 *Adapter flange*

VEGAMIP 62



mm	y	x
1½"	100	ø40
2"	120	ø48
3"	216	ø75
4"	430	ø95

inch	y	x
1½"	3.94"	ø1.58"
2"	4.72"	ø1.89"
3"	8.50"	ø2.95"
4"	16.93"	ø3.74"

Fig. 48: VEGAMIP 62, horn antenna (316L)

VEGAMIP 62, mounting adapter (-40 … +450 °C)

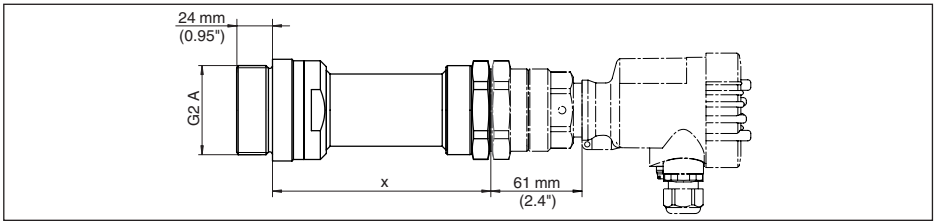


Fig. 49: Mounting adapter with ceramic cover for VEGAMIP 62 with internal horn antenna, threaded version G1½ with PTFE cover (also with 1½ NPT thread)

x 150 mm (5.9 in) or 300 mm (11.8 in)

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